

Impact of Limited Irrigation, and Soil Compaction on Dry Bean Yield and Quality

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Because of the prolonged drought and restrictions on irrigation, dry bean growers in our region have had to modify their production practices in recent years. To help growers optimize dry bean production under limited irrigation, we evaluated the combined effect of variety selection, irrigation scheduling, and level of soil compaction on dry bean yield and quality. Trials included nine varieties (Marquis, Matterhorn, Gemini, Emerson, Orion, Tara, Beryl-R, Roza, and UI-537), four irrigation treatments (0, 50, 75, and 100% of full irrigation), and three levels of compaction (non-compacted, moderately compacted, and heavily compacted). During these 2008 trials, plants received 11.1, 15.2, 17.3, and 19.4 inches of water (precipitation + irrigation) for the 0, 50, 75, and 100% irrigation treatments, respectively.

Yield declined with increasing compaction and decreasing irrigation. Yield was reduced 71 and 84% when soil was moderately and heavily compacted, respectively. Average yield was reduced 35% when irrigation was reduced from 100 to 0%. Yield also varied with variety (range: 1013 to 1270 lbs/acre).

Seed size, as indicated by 100-seed weight, is an indicator of seed quality. One hundred-seed weight was greater in non-compacted plots than in compacted plots and varied with variety (range: 24.6 to 30.7 g). Seed size was reduced an average of 14.2 % when soils were heavily or moderately compacted.

Days to flowering and maturity were less for plants in non-compacted plots than for those in compacted plots and varied with variety (range: 48-60 and 103-112 days, respectively). Flowering was delayed 2 and 3 days and maturity 11 and 9 days when soils were moderately and heavily compacted, respectively.

Additional study is needed before we can make specific recommendations. Therefore, this experiment is being repeated during the 2009 growing season.